The Digital Imaging System

The digital imaging system is made up of a Z-80 8 bit microprocessor, a control system for image-making which includes seven channels of digital to analog and analog to digital conversion with dual floppy disk storage and paper print-out capability. It also contains an image grabber or field buffer and an interface box, the D+7A, with switches and pots to control programs predefined for image manipulations.

The Z-80 conputer is a general purpose computer that can be used to run a range of programs. A number of programs have been developed by David Jones and Paul Davis that allow the computer and the CAT field buffer to interact in some interesting ways. These programs use the D+7A box to control specific parameters of image manipulation.

The D+7A box has 8 digital channels 'in' and 'out' and 7 channels of analog signals 'in' and 'out'. Most of the programs use the 8 digital ins, or switches, and 7 analog ins,mini jacks and pots.

The buffer is a block of memory allowing for the image storage , for example, of one field 256 points on a line by 256 lines by 16 shades of gray. Most of the programs are defined to control the CAT buffer: 1) to draw dots and lines in the buffer 2) to take in and manipulate camera images in the buffer or 3) type out and manipulate text in the buffer. The controls for these programs use the D+7A box.

The keyboard and monitor form the communications link to the computer. They allow you to call up programs; each program has an Explain file which will display on the monitor the layout of the D+7A box controls operative with that particular program. By operating these basic switches and jacks and pots, image manipulations and control strategies can be executed.

NOTES ON THE CAT FIELD BUFFER

The buffer is a block of memory allowing for the image storage, for example, of one field 256 points on a line by 256 lines by 16 shades of gray. This resolution does NOT completely fill the video frame. A norrow black vertical strip at the left side of the frame is the image area not stored in the buffer.

The buffer in its present form stores and plays back a b/w video signal. If you put a color video signal into the buffer it will digitize the chroma information of the signal as a b/w grid mixed with the black and white video information.

The present buffer has no external sync input.

The buffer has one input and four outputs. The outputs are various combinations of gray level outputs. 0o is an output with all sixteen shades of gray. 01,02 and 03 are gray level bit variations of the image. 01 is the most significant bit. 02 is the second most significant bit. 03 is the least significant bit.

PATCHING THE BUFFER

The buffer has a gen-lock at its input so that it locks to the incoming video signal. The b/w camera, VTR or video line signal going into the buffer should go through an output amp first to stabilize the signal before it goes into the gen lock of the buffer. In the studio the three devices which contain output amps are (1) SEG (2) Jones Keyer (3) Jones Colorizer. Pass the b/w camera, VTR or video line signal into one of these devices before connecting it to the input of the buffer. No programs will run unless the output of one of these three devices is patched into the buffer.

STEPS IN TURNING ON THE COMPUTER

1. MAKE SURE THERE ARE NO DISKS IN THE DRIVES.
2. Turn the computer power bar on.
3. Put CAT buffer program disk into disk drive A, the left drive.
4. Press reset button on the D+7A box.

STEPS IN TURNING OFF THE COMPUTER

1. REMOVE DISKS FROM DRIVES.
2. Turn off the power bar.

IMPORTANT...Only leave disk in the disk drive when the computer is ON. REMOVE ALL DISKS BEFORE TURNING THE POWER OFF. YOU WILL ERASE THE DISKS IF THIS IS NOT DONE.

RESET BUTTON

When reset is pushed on the D+7A box, the computer is given the 'bootstrap' program from the program disk. This gives the computer the basic information it needs to begin operating. Once the computer receives the bootstrap, it responds on the terminal display monitor with a 'prompt' which looks like this: A>
This verifies that the computer is in its monitor mode and that it is ready to receive and carry out specific programs.

TO LIST THE DIRECTORY

A>XDIR Once you have pushed the reset and have the prompt, type in the command XDIR and a carriage return which means list the directory. The directory is the index of all the programs, listed alphabetically, which are on the disk.

The programs are listed in the following way:

STROBE32 COM 2K

The first is the name of the program. The second is the type of file. The third is the size of the program.

COM files are commands and are the programs you will run in the computer. XPL files are "explain" files to be displayed on the monitor terminal for describing the use of the D+7A box for that particular program. A program with no file type or description is not a program in the sense of "running a program", but is a data file which can be an image stored on the disk.

TO OPERATE THE BUFFER

PUT all digital switches down and all anaolg switches up on the D+7A box.

THE EXPLAIN PROGRAM

A>EXPLAIN STROBE32 (hit carriage return)

Type in the STROBE32 and hit the carriage return. This means - run the program STROBE32 which begins the computer and CAT buffer operating according to the program definitions of STROBE32. By running a specific program, the buffer and the D+7A box become dedicated to function in specific ways.

CONTROL

To control the computer one must manipulate the parameters of the program by switches, jacks and pots on the D+7A box and described in that program's explain file. The parameters controlled by the pots are also voltage controllable by the jacks immediately under the pots. When running a program notice "TIMER" and "SHADE OF GRAY" parameters. To begin, set the TIMER all the way counterclockwise, so that the controls have the fastest response time. Also adjust the SHADE OF GRAY so that the pixel or shape you are defining is visivble against the background.

TO EXIT THE PROGRAM

The program will run until digital switch 0 on the D+7A box is switched up and the program is exited. You will return to the monitor mode of the computer, the same stage the computer is in when the reset button is pressed. Some programs return to the monitor mode when they are finished.

SUMMARY

To run the program, type in the name of the file and a carriage return. To control the program, manipulate the switches, jacks and pots on the D+7A box as explained in the explain file.

REMEMBER

1. Computer will not run programs unless the output of the SEG, Jones Keyer or Jones Colorizer is connected to the input of the

buffer, #10 on the matrix.

2. The buffer is a b/w processor.

3. Before turning the computer system on of off, MAKE SURE THERE ARE NO DISKS IN THE DRIVES.

4. Buffer will have a more stable image if sync generator is on INT. If you are genlocking a tape, you will need to decide whether the image is acceptable to you.

5. Ringing or echoing in the image is most notifable when you are looking at any one of the other three outputs. The channels on the matrix are not isolated enough to prevent the bleed-throuugh which creates ringing.